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DATA PROCESSING DIGEST

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General Information

THE AUDITOR ENCOUNTERS ELECTRONIC DATA PROCESSING

Report prepared by Price Waterhouse & Co.

This report, prepared for IBM by a national accounting firm, emphasizes the responsibilities of the auditors in assuring that effective internal controls be included in plans for electronic data processing systems. The report has several sections, including: evaluating the internal accounting control, processing accuracy, carrying out audit procedures, using the machine to help, problems relating to conversion to EDP, and speculations on future developments.

CONTENTS

General Information 1
Equipment 11
Management Decision-Making Techniques 12
Programing 13
Comment 14
References 16
Resource 17
Meetings 18
Training 19

In evaluating internal control, electronic data processing does not change the auditor's responsibilities for assuring accuracy of records. Internal control is defined as "the division of duties among the employees of an enterprise in such a manner that no one person has complete control over an important part of a business transaction, and that the work of each employee is checked by another employee carrying out a successive step in the same or related transaction, to the end that the company's assets may be protected against misuse and fraud, and reasonable accuracy of the recorded transactions and of the reports thereon be assured."

The report proposes the use of a "control group" which sends transactions to and receives reports from the data processing center. The control group can establish controls over the employees of the center to insure accurate handling of the data and to preclude fraudulent alterations thereof. An example of a payroll application is cited wherein all changes in pay data, such as rate changes, new employees hired, terminations and changes in pay deductions, of which there were over 25 different types, were routed through the control group. Control techniques, such as authorization slips signed by delegated personnel, must be set up to prevent fictitious employees being entered into the payroll file.

The report makes a significant statement: "The control group must never relax its controls by transferring its work to the computer

"Control group" link between data processing center and other departments

center employees, but it could, if volume warranted, devise means of taking over the operation of the computer for a period long enough to process its own records, using its own programs, its own master files and its own data." ((A detailed discussion of the pros and cons of this point would be most interesting.))

The use of a questionnaire to aid the auditor in reviewing a company's internal control procedures is proposed. Such questions for a payroll system might include: Are the approved authorization slip files maintained independently of, and inaccessible to, persons who are in a position to change the payroll information for their own purposes? Do the time record procedures provide reliable evidence that the time paid for has been worked? Are the payrolls prepared by employees not connected with the engagement or termination of employees and whose duties exclude them from the distribution of the payroll checks or envelopes? For an invoicing operation, the questions might include: Are the serial numbers of all invoices accounted for at the computer center? Is there a direct correlation between the credits to customers' accounts for returned merchandise and the related adjustments to the inventory control records?

Programed and machine checks

In discussing processing accuracy, the report considers both programed checks as well as checks built in to a machine. The programing checks discussed briefly include record counts, hash totals, proof figures, reverse multiplication, limit checks, cross footing balance checks, use of check points (an unsatisfactory result at a particular check point will automatically throw the machine into a restart routine), self-checking numbers, sequence checks, and tape labels.

Auditing is most commonly concerned with testing the adequacy of a system of internal controls and with establishing the integrity of specific items appearing on the financial statements. "It would seem that the auditor's ability to audit specific items appearing in the financial statements will be less affected by the conversion to electronics than his ability to establish the integrity of selected transactions for the purpose of testing the system of internal control." At the present time, most installations prepare visible source material in the same manner as heretofore, converting to machine-sensible information prior to processing. This is fortunate for the auditor. In the future, when source data may be machine-sensible only, detailed records may not be available through which each step in the selected transaction may be traced and its propriety established.

"One of the auditor's prime concerns in an electronic installation is whether the programs will do the job for which they have been designed."

The machine itself may be used to help the auditor. Most commonly, it will print out machine-sensible data. It can check the footings of detail records. It can select items for test check (using random mumbers, if desired). It can reprocess data using the

Machine is used to help auditor

auditor's own programs (although changes to programs occur so frequently that an auditor may find his program obsolete before he has realized on his investment in it).

"The auditor should be in touch with his client during the entire planning period....and will be interested in the questions pertaining to internal accounting control." He must satisfy himself that the period of parallel operation which is planned will be adequate. He will be in a good position to know the type of problem encountered in a particular function and to devise a suitable test problem for the computer. (For instance, hypothetical transactions involving issues of stock prior to the receipt of an invoice can be used to test the program.)

In the future, original source documents may exist in machine sensible form only, or they may be filed (if on paper) in an easy "hysterical" order. This will make it more difficult for the auditor to request that documents be furnished as substantiation for many transactions.

A copy of this report may be obtained from Price Waterhouse & Co., or from the IBM Corporation.

MANAGEMENT LOOKS AT AUTOMATION

Editorial containing quoted material by F. M. Dana, Bank of America
UNITED STATES INVESTOR, February 9, 1957; pages 1-4, 11, 12.

The experience of the Bank of America in planning for and using ERMA and the IBM 702 in check and in loan accounting is reviewed in the light of some "danger error zones" which were encountered.

A list of errors in evaluating electronics

The Bank of America found, for example, that before installing an expensive system, the present manner of performance should be critically questioned "to determine if a less elaborate, more efficient procedure is available." In addition, "many procedures contain expensive safeguards that are not warranted by the risk involved."

In selecting a system, consider the desirability of "in-line" vs "off-line" systems. If it is essential to have information readily available at all times, the in-line system is indicated. However, "this is a very costly approach and, unless thoroughly justified, should be avoided."

Savings in salaries are often considered a large item in cost analyses, but the Bank of America found "that you can only actually realize a reduction to the extent that the equipment replaces people who are engaged full-time in the work to be processed." Also, do the savings resulting from an automated procedure make up for the pro-

cedure's portion of cost of the equipment and the preparation of new methods?

Another potential danger zone is in "selecting equipment which will produce results identical in form to the conventional process." While this does not cause any adjustment problems with personnel or customers, it is costly.

Released space and equipment are frequently given as savings possibilities. However, such savings, if any, are offset by installation costs, site preparation, and maintenance. Down-time may be longer than anticipated, causing delays in data processing which disrupt the system, unless such possibilities have been considered in designing the over-all system to begin with.

Single- versus multi-purpose machines must be viewed in the light of the functions they are to perform. A single-purpose machine which doesn't have enough transactions to use up its time is uneconomical. In this case, the system should probably be geared to a multi-purpose or general purpose system.

INDUSTRY AND THE AUTOMATED FUTURE

John Diebold, John Diebold & Associates, New York
JOURNAL OF MACHINE ACCOUNTING, February 1957; pages 6-8, 28, 29, 33.
COMPUTERS AND AUTOMATION, February 1957; pages 14-19, 43.

At least two major problems have "handicapped a full realization of the potentialities of automation...." The first is that "the businessman concentrates his attention on the hardware or individual machines of automation rather than the system." The second is that "important decisions have often been delegated to technicians rather than dealt with as essentially managerial problems."

The Electronics Committee, which is a favorite way of beginning a "feasibility study," cannot cope with the detailed operational problems upon which an automated system is based. Moreover, "the problem of automation should be specifically assigned as the responsibility of an operating executive" who actually is able to perform the functions he is studying.

Design a good information system first

Personnel selected within the company and thoroughly trained in the automation techniques are to be preferred over outside engineers and scientists. Also, rather than being preoccupied with the equipment, the persons charged with the automation program "should... design the best possible information and communication system for meeting the needs of the organization, whether it relies upon a computer, a simple manual and machine system, or entirely upon humans."

The "step by step approach" in spite of the desirability of caution is misleading, because "the whole concept of systems analysis

and design, which is basic to automation, requires a careful and detailed plan for the entire organization if the benefits realized are to be more than marginal." This careful analysis should always precede evaluation of equipment.

THE PROBABLE IMPACT OF ELECTRONICS ON CREDIT AND COLLECTION OPERATION

J. Douglas Elliot, The Detroit Edison Company, Detroit, Michigan
CREDIT WORLD, February 1957; pages 8-10.

Credit men are shown how an electronic data processing system can help them do a better job of collection and customer relations. A utility company is used as an example of the ways in which controls can be built into the program for the benefit of the credit man. For example, poor-pay customers, bills with large arrears items, or other instances which might need special attention, could be coded for mechanical separation and individual attention. Cash records could be issued periodically (every five days in the example). Uncollectible charge-offs could also be planned for automatic processing.

However, credit men need to recognize several changes in their methods to utilize the electronic system: 1) they must prepare routines geared to the file maintenance cycle of the system; 2) they must express as many as possible of their judgment factors in concrete terms; 3) they should be prepared to use the time freed from clerical drudgery in improving the system, working with the delicate accounts, and concentrating more on customer relations.

SUCCESSFUL OFFICE AUTOMATION

Ralph W. Fairbanks
Published by Prentice-Hall, 1956

One hesitates to describe this as a handbook, because that implies that it is a "how-to" book, which it definitely is not. However, it is organized for quick reference, and has a completeness and clarity which a good handbook should possess. This is directed strictly to top management. It fills a need for the men who must make the important first and final decisions concerning the methods of increasing the efficiency of the office.

After a thorough investigation of the status of the present office and the paperwork which engulfs it, the author describes some of the techniques which may be used to alleviate the situation. Integrated data processing and automatic office machines are described.

The heart of the book comes with the sections on systems analysis, systems planning, and the subsequent activities involved in

Purposes of processed data should determine the system

setting up a new data processing system. The author is profoundly in favor of the objective systems engineering approach, in which the purposes for which data are processed determine the organization of the office. This philosophy is expounded in a detailed and practical manner, providing an excellent pattern of procedure for the company going into such a program.

Likewise, the sections on cost analysis, personnel problems in office reorganization and pitfalls to be avoided are all excellent and valuable material.

The final section describes four successful automated office systems: Gage Publishing, Reader's Digest, Alcoa, and Sylvania.

Price: $10.00

COMPANY INVESTIGATIONS OF AUTOMATIC DATA PROCESSING

Peter B. Laubach, Harvard Business School
Published by Harvard University, 1957

Part of an ongoing study of data-processing, this is "a report of the approaches taken by various companies in investigating their data-processing needs to determine what, if any, automatic equipment they should acquire."

The report is divided into three parts. In Part One, some background material on automatic data-processing equipment is given. This includes some descriptions of "hardware," the difference between general- and special-purpose equipment, and a discussion of flow-diagraming, programing, and coding.

Part Two gives some case histories of company methods for surveying and evaluating computers. A detailed study is made of one company, in which a crash program to test a payroll application confused the overall picture. This is followed by less detailed histories of six others, including Commonwealth Edison, Franklin Life, Allstate and others. Several case illustrations on the use of special-purpose equipment are then given, including American Airlines' Reservisor.

Part Three evaluates the methods of studying a company's computer needs, estimating costs and savings, gaining management support, and similar topics. A careful and thorough job, the report could be of value to companies contemplating a computer study.

Price: $3.00

THE OFFICE IN TRANSITION

Esther R. Becker and Eugene F. Murphy
Published by Harper & Brothers, 1957

Perhaps the chief virtue of this new book is that it contains the essence of a majority of the magazine articles listed in DPD during the past two years. This is convenient for the person who needs to catch up and get into step with everyone else. In addition to the 148 pages of text, several appendices provide source information on equipment, associations, educational institutions, and publications pertinent to the office automation field.

The main part of the book, divided into 14 chapters, considers the term "office automation" as a "means of freeing people from routine drudgeries. . . . Automation isn't something that will happen. . . tomorrow, or next year. It has happened, and will continue to happen as long as we all have the urge to make things easier for ourselves." There is a tendency in the book to view the office's function as a group of isolated, though interlocked, duties, such as "payroll" or "inventory control," which may be more efficiently done through the use of automated techniques. Within the somewhat limited latitude of this concept, the section on systems analysis is probably the most detailed and useful section.

The writing is clear, and frequent examples are used to illustrate points. The importance of the programer in a computer system is well defined. Price: $3.50

LET ERMA DO IT

David O. Woodbury
Published by Harcourt, Brace and Company, 1956

The sub-title of this book is "The full story of automation." Naturally, this is an over-ambitious claim, but there is little left unmentioned, at least, about this vast and complex field. It is a very competent layman's introduction to the subject.

The first section, consisting of 14 chapters, explores the term "automation," its meaning in the industrial sense, and the changes it could make in our lives. The second half (26 chapters), from which the book derives its punned title concerns the vast potentials of office automation. ERMA is described in some detail as an example of the special purpose or "idiot" type of computing system. Other special and general purpose computers are then mentioned in the context of the areas of their use. Scientific management is also touched upon briefly. The bibliography is confined to introductory and philosophical books such as Wiener's "The Human Use of Human Beings." Price: $5.00

PREPARING FOR OFFICE AUTOMATION

H. W. Rowlands, J. D. Woods and Gordon Ltd., Toronto, Canada
COST AND MANAGEMENT, February 1956; pages 66-75.

Top management should receive computer education in order to assess the possibilities of using electronic equipment in their own company. More detailed study would then be undertaken by a group who would define the applications in more detail. A part of the investigation would be an analysis of present procedures and an integration of the functions which could be handled by a common electronic process. Flow charting will take a major portion of the planning time. Canadian readers will find this report helpful to them in following a reasonable and generally acceptable plan of study.

PROBLEMS IN MECHANIZING THE SEARCH IN EXAMINING PATENT APPLICATIONS

Simon M. Newman, U.S. Patent Office
U. S. Patent Office, Department of Commerce

USHERING IN NEW LOOK IN PATENT SEARCHING

CHEMICAL WEEK, January 19, 1957, pages 52-56.

Literature and patent searching becomes an increasingly troublesome problem. The pamphlet from the Patent Office shows the process a patent searcher now goes through in looking for disclosures and presents some of the problems that might be involved in encoding so as to anticipate what a future searcher might want to know about a given item. The conclusions reached are that 1) a series of codes must be constructed for mechanical searching; 2) at least 7 million "disclosures" need to be analyzed and coded, each disclosure requiring a large number of codes to anticipate a future researcher's needs, and 3) the apparatus and methods for using the codes must be created.

CHEMICAL WEEK describes the tests now being tried on 350 chemical patents, using both punch card and computer techniques. The 350 steroids have been coded, using topology, and the coded data is transcribed on magnetic tape. The SEAC computer of the Bureau of Standards is being used. Both the computer and punch card methods have their limitations for patent searching, and those in charge of the project admit that the ultimate patent-searching machine probably hasn't yet been devised. Plans are being made to convert the entire chemical patent field to a mechanized system. Other fields will follow, but the chemical field was the first to be tried because chemists have developed a rigorous and consistent identification of compounds.

PHYSICAL FACILITIES

COMPUTING NEWS, March 1, 1957; pages 9-12.

Some of the less frequently discussed aspects of providing for computer housing are contained in this article, which is obviously written from experience. For example, there is a warning to consider the weather history in providing the air conditioning, since the equipment must be designed for the extreme condition possible at the plant (not at the weather station some distance away). Number of machines and people in the room also affect the delicate balance between adequate and inadequate cooling. Cleanliness is a prime requisite, and it should be remembered that mopping would have an affect on the humidity of the room. Standby or emergency equipment must be available. Room to move machines about, and to add more equipment should be considered. Lighting should be generous, but not cause a glare near the console, making the neon lights difficult to read. Many other factors which may seem insignificant, but which are of extreme importance in the physical set-up are mentioned.

STAFF AND ORGANIZATION AND THEIR TRAINING

COMPUTING NEWS, February 15, 1957; pages 8-11.

The EDPM staff should include some persons with experience in mechanized data processing fortified with some training in the use of electronic equipment. A tab operator who knows how to think should be able to do a good job of operating the electronic equipment. However, it is more difficult to define the qualities which make a good programer. "Learning by doing" is at present the best way of becoming a programer. Good flow charts, however, are essential, and should be standardized within the company. A conservative estimate of time for training EDPM people is three months.

WHAT INTEGRATED DATA PROCESSING AIMS AT

Harold G. Hunsberger, Lybrand, Ross Bros. & Montgomery, Philadelphia
N.A.C.A. BULLETIN, February 1957; pages 733-739.

Integrated data processing is viewed as a method of "creating a complete information pool from which management can economically obtain desired information." The method is, of course, to record source data in a common language form along with the creation of a document. It is based, however, on "a plan of accounting which, taking advantage of natural relationships of source data and its ultimate use, requires coordination of operational and statistical reporting."

BUSINESS ELECTRONICS REFERENCE GUIDE

Published by Controllership Foundation, 1956.

For persons actively concerned with the field of electronic data processing, the Controllership Foundation Reference Guides are indispensable. This is the newest edition. The guide contains the following kinds of references: Index to computer installations and business applications, cross-indexed by manufacturer and user; a list of commercial computing centers; descriptions and characteristics of the equipment of 18 manufacturers; a list of conferences, seminars, and training programs; a list of periodicals with a brief annotated bibliography of articles; miscellaneous papers, pamphlets, etc.; an annotated bibliography of texts in the EDP field.

Price: $6.00 (For members of Controllers Institute: $5.00)

ELECTRONICS AND BANKS

Pamphlet published by Peat, Marwick, Mitchell & Co., 1956

This 37-page report was compiled for the banking clients of the accounting firm which published it. The first part reviews the requirements of banks and the limitations which must be imposed on an electronic system servicing a depositor accounting system. The second part discusses the present equipment of five manufacturers which has been designed or adapted for bank use. The final section describes four independent bank research projects, including ERMA, DIANA, and First National New York and First National Chicago projects. A copy of the pamphlet may be obtained from Peat, Marwick, Mitchell &Co., 70 Pine Street, New York 5, N. Y.

Equipment

HIGH-SPEED TV OFFICE DUPLICATOR

RESEARCH FOR INDUSTRY (STANFORD RESEARCH INSTITUTE), January 1957

SRI is developing for the A. B. Dick Company, a high-speed office duplicating device which uses closed circuit TV for multiple reproduction of documents. The reproduction speeds exceed those of facsimile transmission.

Copies are printed directly from original documents at the rate of about 17,000 characters of elite type per second (equal to about three $8\frac{1}{2}$x11 sheets). Phototubes receive light reflected from the document and emit electrons proportional to the amount of light reflected into them. The video signal is transmitted to receivers through a coaxial cable or is broadcast as a TV signal. At the receiver, the signal is amplified and applied to the grid of the cathode-ray tube in charges proportional to the lightness or darkness of the characters on the document. Immediately, a small dot of electric charge is deposited on copy paper. After the copy paper is pulled past the faceplate, it is mechanically dusted with black powder which clings to the charge on the paper's surface. The powder is heated and pressed into the paper to make a permanent record.

HOW ELECTRONICS CAN TRAIN TOMORROW'S OFFICE WORKERS

BUSINESS, December 1956; pages 87, 88.

The Solartron Electronic Group Ltd. in England is developing a device designed by Gordon Pask, which may be described as a "brain simulator." The device (called Eucrates) is being considered by at least one large concern to train operators of office machinery. "Eucrates" can be programed for the task to be taught. It asks the trainee questions, and by means of analyzing the answers determines how well the trainee understands the subject. Eucrates then proceeds with the training on the basis of this analysis. Mr. Pask anticipates the use of such a device in flight control in which Eucrates would "match" each pilot's individual mental characteristics and translate relevant data into a form suited to the individual, then present it to him at the exact speed at which he could assimilate it.

DIGITAL MAGNETIC TAPE MULTIPLE BIN HANDLER

A new tape handler consisting of ten separate identical units or bins each with a storage capacity of over 8 million bits, has been announced by Potter Instrument Company, Great Neck, Long Island. Each bin has its own read-write head which may be relay switched to a common output. Decimal sorting may be done at rates up to 100 information blocks per second. The tape handler may also be used as a random access memory. The tape handler may be used with the Potter Magnityper for high speed printout.

MECHANIZATION IN LIBRARIES

JOURNAL OF DOCUMENTATION, December 1956; page 264.

The Center for Documentation and Communication Research at Western Reserve University has acquired a machine designed for research and instructional purposes. It will scan from two to five abstracts per minute. The speed has been kept low in order to make its operation easy to understand for students. The abstracts are coded on to paper tape. When the machine finds the code it is seeking, the serial numbers of the abstracts are typed out.

Management Decision-making Techniques

OPERATIONS RESEARCH—A BASIC APPROACH

Special Report No. 13 published by American Management Association, 1956

Eight papers from the AMA seminar on operations research early last year have been collected in this report, which represents "an attempt to discuss operations research without excessive dependence on mathematical formulas, and to show the result obtained to date in a number of industries." The industries represent mining, transportation, manufacturing, and accounting service. Each paper contributes to the general understanding of operations research without such a detailed description of the writer's own application of OR that the reader cannot apply the principles to his own problems.

Consider this report a basic item in the operations research bookshelf.

Programing

BUSINESS APPLICATIONS OF COMPUTERS

G. V. Scully, Computing Devices of Canada, Ltd., Ontario
OFFICE EQUIPMENT NEWS, November 1956; pages 16-18.

Programing is described in a brief, elementary fashion, with examples and diagrams, using an inventory control problem of a large transportation company which operates twelve supply depots across the country on which maintenance and construction personnel requisition supplies. The system must operate so that the probability of being out of stock at any one depot is reasonably small, while at the same time the amount of capital tied up in stock is minimized. A flow diagram is given of the requisition system, and a small portion of the computer instructions from the program routine is interpreted for the reader. It is shown that the computer processes the data accurately and economically at a high rate of speed, and in addition can take over a low level decision function which formerly required human effort.

HOW THE FOUR-TAPE SORTER SIMPLIFIES STORAGE

Richard G. Canning, Canning, Sisson and Associates, Los Angeles
CONTROL ENGINEERING, February 1957; pages 95-97.

Since most EDP systems use magnetic tape for file storage, one of their biggest problems is minimizing access time to the stored data. Described in this article is the four-tape, merging-sort method. A liberal use of diagrams and clarity of writing style make the article easy to read and understand.

Comment

A MATHEMATICAL BACKGROUND FOR O-R?

A number of courses are now offered an operations research, and many articles are being written. Some courses and articles propose to explain OR without reference to mathematics; others require varying degrees of mathematical background. Just how much math is needed?

Briefly, the answer is that

1. To do OR work requires a deep understanding of mathematical techniques and methods;

Managing an OR group requires math knowledge

2. Without math, a person cannot fully understand what the OR group is doing--their selection of problems, establishment of objectives, methods of approach, and solutions of the problems.

3. Without math, and if the OR man presents the solution properly, a person can have some understanding of the rules developed by the OR group, and how these rules can be tested.

In particular, necessary techniques include algebra, matrix algebra (and in some cases other forms of higher algebra), differential and integral calculus, differential equations, probability theory, and statistics; and for some applications, topology, combinatorial analysis, and other higher mathematical disciplines. Algebra, probability theory, and calculus are basic. The others need not be part of the researcher's every-day tools, but he should be aware of the other disciplines and be capable of using them when needed after the appropriate study.

What then can one learn of OR without reference to mathematics? If a person has any appreciation for the use of symbols, then it is possible to appreciate what OR can do in industry. Particularly one should be able to appreciate OR as an investment possibility--an investment in improved decision-making.

It should be possible for a manager who does not have a knowledge of math to recognize good OR personnel, but such recognition would be based upon a study of the person's background, experience, and reputation, and not on a direct quizzing of the person about his technical know-how.

Finally, there is the problem of understanding what an operations researcher is doing. By examples, a good OR man can usually make the results of a particular study clear to the non-mathematician. It is doubtful that he can make his justification of his techniques clear without math--the non-math man will have to take that on faith. The rules for testing and using the technique and the results promised usually require little math. Sometimes some algebra is helpful. Also important is the fact that the reasons for, and implications of the simplifications which the mathematician almost always has to make in the problem structure cannot be fully appreciated by the non-mathematician.

The conclusions from these remarks are:

1. It may be possible to manage an OR group without knowing math; but it is not very desirable.

2. Young men hoping to be business managers must begin to take mathematics seriously--not so much for doing OR work, as to be able to understand what the OR people are doing.

3. Business schools must offer mathematics at least as optional features of their curricula.

For those who wish to improve their mathematical background, a course in college algebra is suggested (preceded by a review of high-school algebra if necessary). This should be followed by courses in probability theory and in calculus. After these, the student will be able to chart his own course of study.

References

The addresses of publishers and periodicals mentioned in this issue of Data Processing Digest are listed below for your convenience in obtaining further information about the articles or books listed.

American Management Association
1515 Broadway, Times Square
New York 36, New York

Business
Mercury House
109-119 Waterloo Road
London SE 1, England

Chemical Week
330 West 42nd Street
New York 36, New York

Computers and Automation
815 Washington Street
Newtonville 60, Massachusetts

Computing News
12805 - 64th Avenue South
Seattle 88, Washington

Control Engineering
330 West 42nd Street
New York 36, New York

Controllership Foundation, Inc.
Two Park Avenue
New York 16, New York

Cost and Management
66 King Street, E.
Hamilton, Ontario, Canada

Credit World
375 Jackson Avenue
St. Louis 5, Missouri

Harcourt, Brace & Co., Inc.
383 Madison Avenue
New York 17, New York

Harper & Bros.
49 East 33rd Street
New York 16, New York

Harvard Business School
Soldiers Field
Boston 63, Massachusetts

Journal of Documentation
4 Palace Gate
London W 8, England

Journal of Machine Accounting
53 West Jackson Boulevard
Chicago 4, Illinois

N. A. C. A. Bulletin
505 Park Avenue
New York 22, New York

Office Equipment News
146 Bates Road
Montreal 8, Canada

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey

Research for Industry
Stanford Research Institute
Menlo Park, California

United States Investor
286 Congress Street
Boston 10, Massachusetts

Resource

The following periodicals are reviewed regularly by the publishers of DATA PROCESSING DIGEST for significant information in the data processing and related fields.

The Accountant*
Accounting Review
Advanced Management
Aeronautical Engineering Review
A. I. E. E. Review
American Business
American Documentation
American Gas Association Monthly
Armed Forces Management
Automatic Control
Automation
Automation Consultants
Aviation Age
Banking
Bell Laboratories Record
Best's Insurance News
Burroughs Clearing House
Business*
Business Week
Chain Store Age
Chemical Week
Computers and Automation
Computing News
Consulting Engineer
Control Engineering
The Controller
Cost and Management**
Credit and Financial Management
Credit Executive
Credit World
Data Processor
Department Store Economist
Documation
Dun's Review
Elecom Pulse
Electrical Engineering
Electronic Design
Electronic Week
Electronics
Engineering News Record
Factory Management and Maintenance
Forbes
Fortune
Federation Internationale Documentation
Harvard Business Review
Industrial Quality Control
Instruments and Automation
Internal Auditor
I. R. E. Proceedings
I. R. E. Transactions
Journal of Accountancy
Journal of Association for Computing Machinery
Journal of Documentation*
Journal of the Franklin Institute
Journal of Industrial Engineering
Journal of Institution of Production Engineers*
Journal of Machine Accounting
Journal of Society for Industrial and Applied Mathematics
Life Association News
Management Methods
Management Science
Mechanical Translation
Merchants Trade Journal
Modern Office Procedures
Modern Railroads
N. A. C. A. Bulletin
Nation's Business
The Office
Office Appliances
Office Equipment News**
Office Executive
Office Management
Operational Research Quarterly*
Operations Research (Journal of ORSA)
Operations Research Digest
Pacific Electronics Monthly
Paperwork Simplification
Production
The Programmer
Publishers Weekly
Railway Age
Research for Industry (Stanford Research Institute)
SAE Journal
The Spectator
Stores
Systems and Procedures Quarterly
Systems Magazine
Technical News Bulletin
Tooling and Production
U. S. Investor
U.S. News and World Report
Wall Street Journal
Western Electronic News

*European
**Canadian

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Meetings

International Conference and Exposition sponsored by NOMA.

Date: May 12-16, 1957
Place: Los Angeles, California (Statler Hotel)
Information: National Office Management Association,
132 West Chelten Avenue, Philadelphia 44, Pa.

Eighth Annual National Conference of American Institute of Industrial Engineers

Date: May 16-18, 1957
Place: New York City (Statler Hotel)
Session topics: Incentives: Pro and Con; Design of a Management Reporting System; Applying Statistics to Industrial Engineering; Are We Going Overboard with Cost Figures?

American Institute of Industrial Engineers Annual Conference

Date: May 16-18, 1957
Place: New York City (Hotel Statler)
Information: American Institute of Industrial Engineers, P.O. Box 8, Substation 135, New York 53, New York

Twelfth Annual Meeting, The Association for Computing Machinery

Date: June 19-21, 1957
Place: University of Houston, Houston, Texas
Submit abstracts to: J. E. Robertson, Chairman
ACM Program Committee
University of Illinois
Urbana, Illinois

International Conference on Operational Research, sponsored by Operational Research Society, Operations Research Society of America, The Institute of Management Sciences.

Date: September 2-6, 1957
Place: University of Oxford, England
Subjects: The common themes in operational research, methodology, applications

Conference on Matrix Computations

Date: September 3-6, 1957
Place: Department of Mathematics, Wayne State University
Information: Professor Wallace Givens, Chairman,
Department of Mathematics, Wayne State University,
Detroit 2, Michigan

Third Electronics Business Systems Conference sponsored by the Western Division of National Machine Accountants Association

Date: November 7, 8, 1957
Place: San Diego, Calif. (U.S. Grant Hotel)
Information: G. M. Blakesley, Third Electronic Business Systems Conference, P.O. Box 1448, San Diego 12, California

Eastern Joint Computer Conference

Date: December 1957
Place: Washington, D. C.

Training

Electronic Data Processing for Business and Industry, University of California at Los Angeles

Date: April 22-26, 1957
Place: UCLA Hillstreet Building, Rm. 515
Fee: $100
Information: UCLA Engineering Extension, Los Angeles 24, California

Orientation Seminars on EDP and IDP, sponsored by AMA

Dates: May 13-15, June 17-19
Place: New York City (Sheraton-Astor Hotel)
Fee: $150 (AMA members) $175 (non members)
Information: American Management Association, 1515 Broadway, Times Square, New York 36, N. Y.

Electronic Data Processing for Business and Industry (sponsored by Canning, Sisson and Associates)

Date: May 20-24, 1957
Place: New York City (Park Sheraton Hotel)
Fee: $160
Program: Emphasis on the applications aspect of electronic data processing
For whom: Controllers, Methods and Procedures Supervisors, others in management charged with setting up an EDP system
Information: Canning, Sisson and Associates, 1140 South Roberstson Blvd., Los Angeles 35, Calif.

Seminars in operations research presented by Operations Research Institute

Date: One seminar each month through June, 1957
Subjects: Inventory and production management, Linear programming, Forecasting and budgeting.
Information: Operations Research Institute, Inc., 41 Fifth Avenue, New York 3, New York

Short Course in Operations Research, Case Institute of Technology

Date: June 3-14, 1957
Place: Case Institute, Cleveland, Ohio
Registration: Enrollment is limited to 50
Information: W. W. Abendroth, Conference Director, Operations Research Group, Case Institute of Technology, Cleveland 6, Ohio

Summer Program, Wayne State University Computation Laboratory

Courses and Dates: June 3-8, Introduction to Computers and their Applications
June 10-15, Data Processing in Business and Industry
September 9-14, Industrial and Management Computer Applications
Information: A. W. Jacobson, Director, Computation Laboratory, Wayne State University, Detroit 2, Michigan

Summer Session, 1957, University of Michigan--"Intensive Courses for Men in Engineering, Science, and Business"

Date: Courses begin June 17
Place: University of Michigan, Ann Arbor, Michigan

Courses in the Computer and Management Sciences:
(Others are offered in industrial subjects)

Introduction to Digital Computer Engineering
Advanced Digital Computer Engineering and Logical Design
Introduction to the Electronic Digital Computer and Its Applications
Applications of Advanced Numerical Analysis to Digital Computer Problems
Applications of Logic to Advanced Digital Computer Programing
Management Sciences

Dates: For above courses only, August 19-30
Fee: For each of above courses only, $200
Registration and Information: Co-ordinator of Engineering Summer Conferences, 2038 East Engineering Building, Ann Arbor, Michigan

Electronic Data Processing for Business and Industry (sponsored by Canning, Sisson and Associates)

Date: July 22-26, 1957
Place: New York City (Hotel Roosevelt)
For further information see third course listing above

Master's Program in Automatic Data Processing, Wayne State University (School of Business Administration and the Computation Laboratory)

Information: Walter Folley, Dean, School of Business Administration, or A. W. Jacobson, Director, Computation Laboratory, Wayne State University, Detroit 2, Michigan